OPTIONS FOR LIVER BIOPSIES

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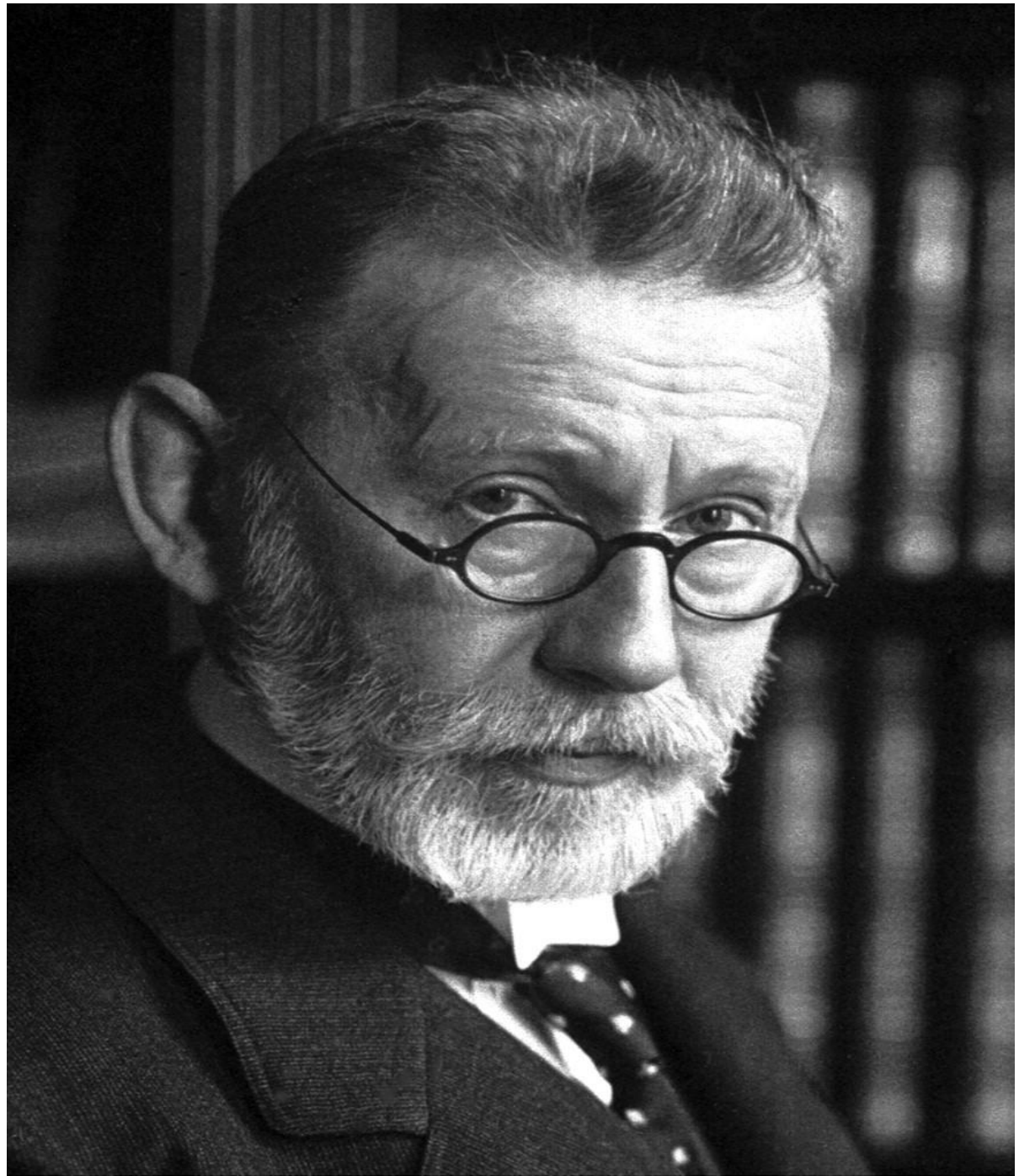

INDICATIONS:

Indications for liver biopsy

Diagnosis, grading, and staging of alcoholic liver disease, nonalcoholic steatohepatitis, and autoimmune hepatitis
Grading and staging of chronic hepatitis B and C
Diagnosis of:
• Hemochromatosis (quantitative estimation of hepatic iron) • Wilson's disease (quantitative hepatic copper) • Focal liver lesions
Evaluation of:
• Cholestatic liver disease: primary biliary cirrhosis, primary sclerosing cholangitis • Abnormal liver biochemical tests in a patient with a negative or inconclusive serologic work-up • Treatment efficacy • Side effects of treatment regimens (such as methotrexate for rheumatoid arthritis) • Post liver transplant by protocol or for evaluation of abnormal liver biochemical tests • Donor liver • Fever of unknown origin

Adapted from: Bravo AA, Sheth SG, Chopra S. Liver biopsy. N Engl J Med 2001; 344:495.

American Association for the Study of Liver Diseases (AASLD) liver biopsy recommendations

Focal disease and mass lesions
Liver biopsy should be considered in patients in whom diagnosis is in question, and when knowledge of a specific diagnosis is likely to alter the management plan.
Liver histology is an important adjunct in the management of patients with known liver disease, particularly in situations where (prognostic) information about fibrosis stage may guide subsequent treatment; the decision to perform liver biopsy in these situations should be closely tied to consideration of the risks and benefits of the procedure.
Technical issues, contraindications, and complications
Prior to performance of liver biopsy, patients should be educated about their liver disease and about investigations other than liver biopsy (if any) that may also provide diagnostic and prognostic information.
Prior to performance of liver biopsy, patients must be carefully informed about the procedure itself including alternatives (as above), risks, benefits, and limitations; written informed consent should be obtained.
Management of medications
Antiplatelet medications should be discontinued several to 10 days before liver biopsy, although there is uncertainty surrounding the need for their discontinuation. Management of specific compounds should be handled on a case-by-case basis, taking into account their clinical indications, as well as the potential bleeding risk associated with their use in the setting of liver biopsy.
Anticoagulant medications should be discontinued prior to liver biopsy. Warfarin should generally be discontinued at least five days prior to liver biopsy. Heparin and related products should be discontinued 12 to 24 hours prior to biopsy. In all patients, the risk of discontinuing anticoagulant medications must be weighed against the (potential) risk of bleeding during/after liver biopsy.
Antiplatelet therapy may be restarted 48 to 72 hours after liver biopsy.
Warfarin may be restarted the day following liver biopsy.
Liver biopsy procedure
Performance of liver biopsy requires an adequate sized and dedicated physical space suitable for focused physician effort as well as safe patient recovery.
The use of sedation, preferably light sedation, is safe and does not lead to increased procedural risk.
Vital signs must be frequently monitored (at least every 15 minutes for the first hour) after liver biopsy.
The recommended observation time after biopsy is between two to four hours and will vary depending on local expertise and practice.
Ultrasound guidance with marking of the optimal biopsy site performed immediately preceding biopsy, by the individual performing the biopsy, is preferred, though not mandatory, because it likely reduces the risk of complications from liver biopsy.
Contraindications
Percutaneous liver biopsy with or without image guidance is appropriate only in cooperative patients, and this technique should not be utilized in uncooperative patients.
Uncooperative patients who require liver biopsy should undergo the procedure under general anesthesia or via the transvenous route.
In patients with clinically evident ascites requiring a liver biopsy, a transvenous approach is generally recommended, although percutaneous biopsy (after removal of ascites) or laparoscopic biopsy are acceptable alternatives.
Patients who require liver biopsy and who have a large vascular lesion identified on imaging should undergo the procedure using real-time image guidance.
The decision to perform liver biopsy in the setting of abnormal laboratory parameters of hemostasis should continue to be reached as the result of local practice(s) and consideration of the risks and benefits of liver biopsy because there is no specific PT-INR and/or platelet count cutoff at or above which potentially adverse bleeding can be reliably predicted.
Complications
Those performing liver biopsy must be cognizant of multiple potential complications (including death) that may occur after liver biopsy and discuss these appropriately with their patients beforehand.
Platelet transfusion should be considered when levels are less than 50,000 to 60,000/mL (this applies whether one is attempting biopsy transcutaneously or transvenously).
The use of prophylactic or rescue strategies such as plasma, fibrinolysis inhibitors, or recombinant factors should be considered in specific situations, although their effectiveness remains to be established.
In patients with renal failure or on hemodialysis, desmopressin (DDAVP) may be considered, although its use appears to be unnecessary in patients on stable dialysis regimens.
Patients on chronic hemodialysis should be well dialyzed prior to liver biopsy, and heparin should be avoided if at all possible.
Radiological considerations
Image-guided liver biopsy is recommended in certain clinical situations including in patients with known intrahepatic lesions (real-time imaging is strongly preferred) and in those with previous intraabdominal surgery who may have adhesions. Image-guided liver biopsy should also be considered in the following situations: patients with small livers that are difficult to percuss, obese patients, and patients with clinically evident ascites.
Pathological considerations
Because diagnosis, grading, and staging of nonneoplastic, diffuse parenchymal liver disease is dependent on an adequate sized biopsy, a biopsy of at least 2 to 3 cm in length and 16-gauge in caliber is recommended.
It is recommended that if applicable, the presence of fewer than 11 complete portal tracts be noted in the pathology report, with recognition that diagnosis, grading, and staging may be incorrect due to an insufficient sample size.
If cirrhosis is suspected, a cutting rather than a suction needle is recommended.
In clinical practice, use of a simple (eg, Metavir or Batts-Ludwig) rather than complex (eg, Ishak) scoring system is recommended.

EQUIPMENT:

- SUCTION NEEDLES (MENGHINI NEEDLE, KLATSKIN NEEDLE, JAMSHIDI NEEDLE)
- CUTTING NEEDLES (VIM-SILVERMAN NEEDLE, TRUCUT NEEDLE)
- SPRING-LOADED CUTTING NEEDLES THAT HAVE TRIGGERING MECHANISMS (MICROVASIVE)

- PERCUTANEOUS
- LAPAROSCOPIC
- OPEN

PERCUTANEOUS:

- COMMONLY EMPLOYED OPTION
- BLIND BIOPSY
- ULTRASOUND GUIDED (CONTRAST ENHANCED)
- REAL TIME

PALPATION-PERCUSSION:

“Blind” liver biopsies should be performed by experienced gastroenterologists, hepatologists, or transplantation surgeons and not by general internists.

Garcia-Tsao G, Boyer JL. Outpatient liver biopsy: how safe is it? Ann Intern Med1993;118:150-153

ULTRASOUND:

- Ultrasound changed management 15.1% of patients.

Riley TR 3rd :Am J Gastroenterol. 1999;94(11):3320.

- The use of ultrasonography for guidance of percutaneous liver biopsy will lead to a lower rate of complications. The value of this benefit must be weighed against the added cost of ultrasonographic guidance.

Lindor KD et al: Hepatology. 1996;23(5):1079.

- Routine ultrasound of the puncture site is a quick method of assessment, allowing one to increase the diagnostic yield of percutaneous liver biopsy and to maintain low complication rates for such a procedure.

Caturelli E Am J Gastroenterol. 1996;91(7):1318 et al:

LAPAROSCOPIC:

Indications for and contraindications to laparoscopic liver biopsy

Indications
Same as for percutaneous liver biopsy
When a liver biopsy is needed in the presence of ascites
When a laparoscopy is needed for: A. Staging of malignancy B. Diagnosis of peritoneal infections (like tuberculosis) C. Evaluation of abdominal mass
Contraindications
Absolute: • Severe cardiopulmonary failure • Bowel obstruction • Spontaneous or secondary bacterial peritonitis
Relative: • Uncooperative patient • Significant coagulopathy or thrombocytopenia • Morbid obesity • Large ventral hernia

Adapted from: Bravo AA, Sheth SG, Chopra S. Liver biopsy. N Engl J Med 2001; 344:499.

LAPAROSCOPIC

- DIRECT VISUALISATION
- IMMEDIATE HAEMOSTATIC CONTROL
- IDENTIFICATION OF OTHER LESIONS

LAPAROSCOPIC:

Complications of diagnostic laparoscopy (from a total of 1794 laparoscopies)

Major	
Abdominal viscous perforation	3
Bleeding from biopsy site	2
Hemobilia	2
Spleen laceration	1
Total	8
Minor	
Ascitic fluid leakage	9
Abdominal wall hematoma	6
Vasovagal reaction	5
Prolonged abdominal pain	4
Seizures	1
Total	31

Data from: Vargas C, Jeffers LJ, Bernstein D, et al. Am J Gastroenterol 1995; 90:1258.

OPEN:

- NOT COMMON

- USUALLY PART OF OPEN SURGERY FOR OTHER REASONS

- INCIDENTAL FINDING

CONCLUSION

- THE USE OF LIVER BIOPSY TO OBTAIN TISSUE FOR HISTOLOGICAL INTERPRETATION IS A LONG STANDING PILLAR OF THE PRACTICE AND SCIENCE OF HEPATOLOGY AND REMAINS A STANDARD FOR DIAGNOSIS AND TREATMENT TO WHICH NUMEROUS OTHER TESTS ARE HELD.

Rocky et al: Hepatology ,Vol. 49,No. 3, 2009